

The CleanProd Integrated Project Proposal

Innovative units from designing to customized use

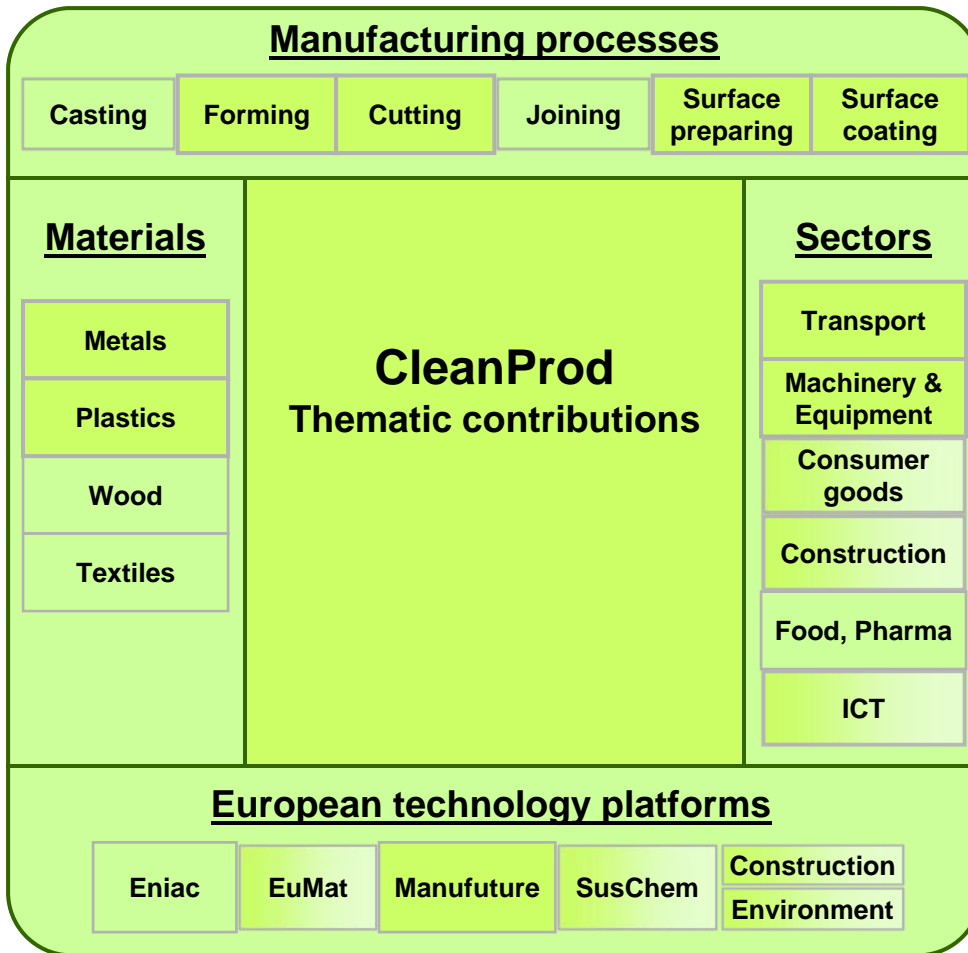
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Focus fields



Addressing major manufacturing processes, materials technologies and product/market sectors



Functional surfaces are the key to high added-value products

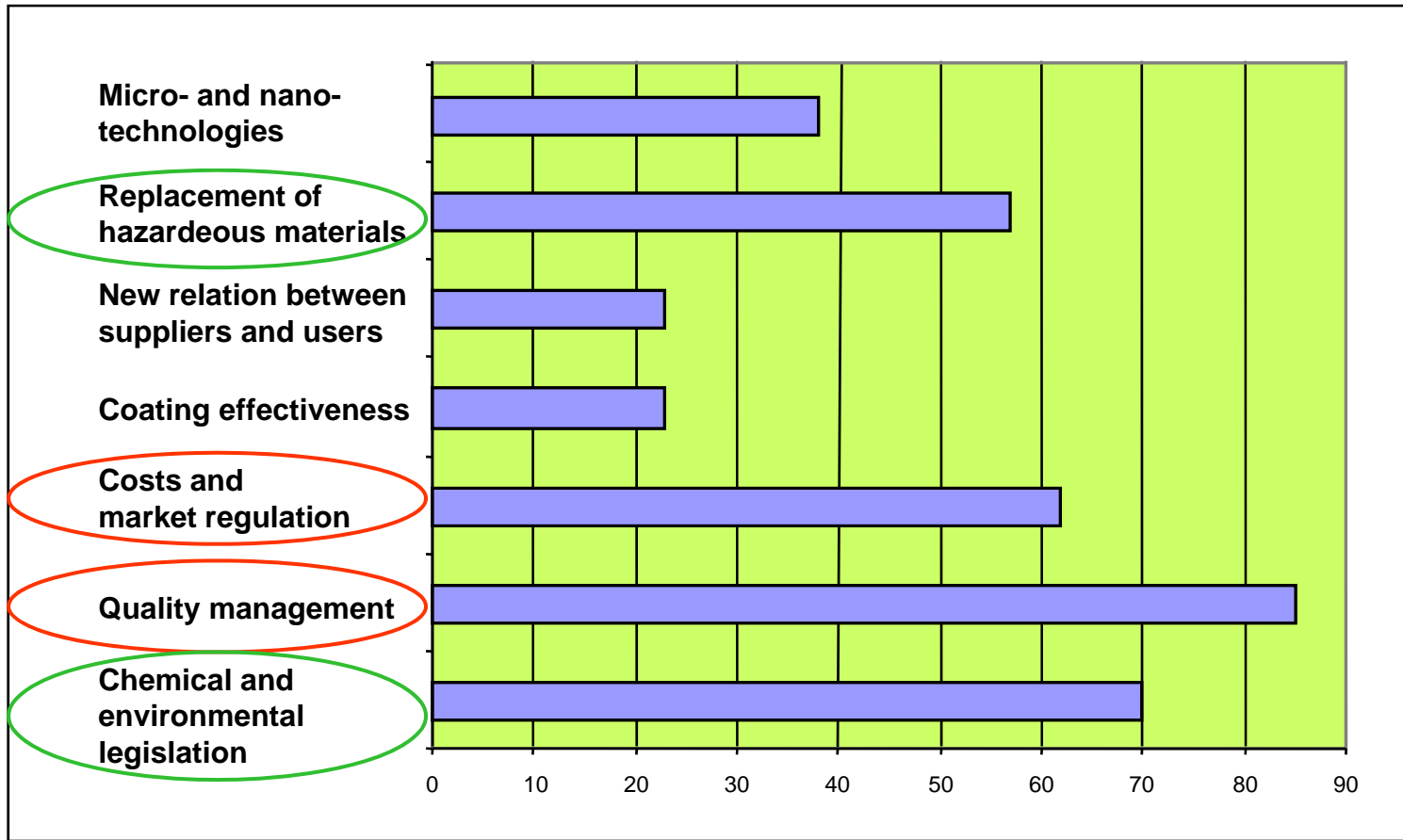
Large optimisation potential exists at the production interfaces:

Forming/machining
Surface preparation
Surface coating
Application

Driving forces



Overall, competitiveness and sustainability are the key issues for technological development in the manufacturing sector

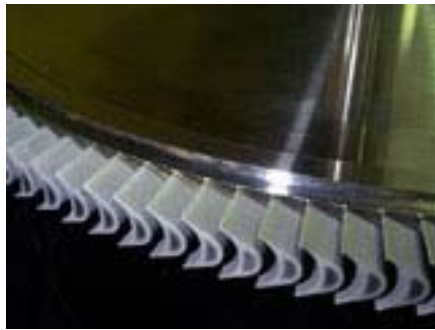


A holistic view required



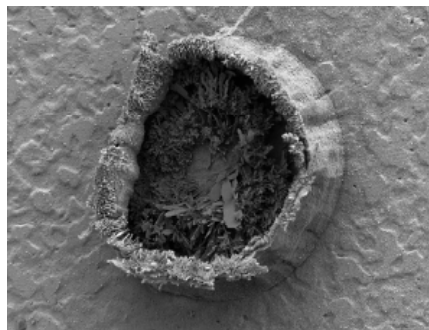
Competitive manufacturing of high added value products requires knowledge from all parts of the production chain

- Knowledge of the properties of the parts delivered
- Knowledge of the properties of the refined parts
- Knowledge of the type of application of the produced parts



Machining

Comprehensive high added value of the units by integrated processing



Processing

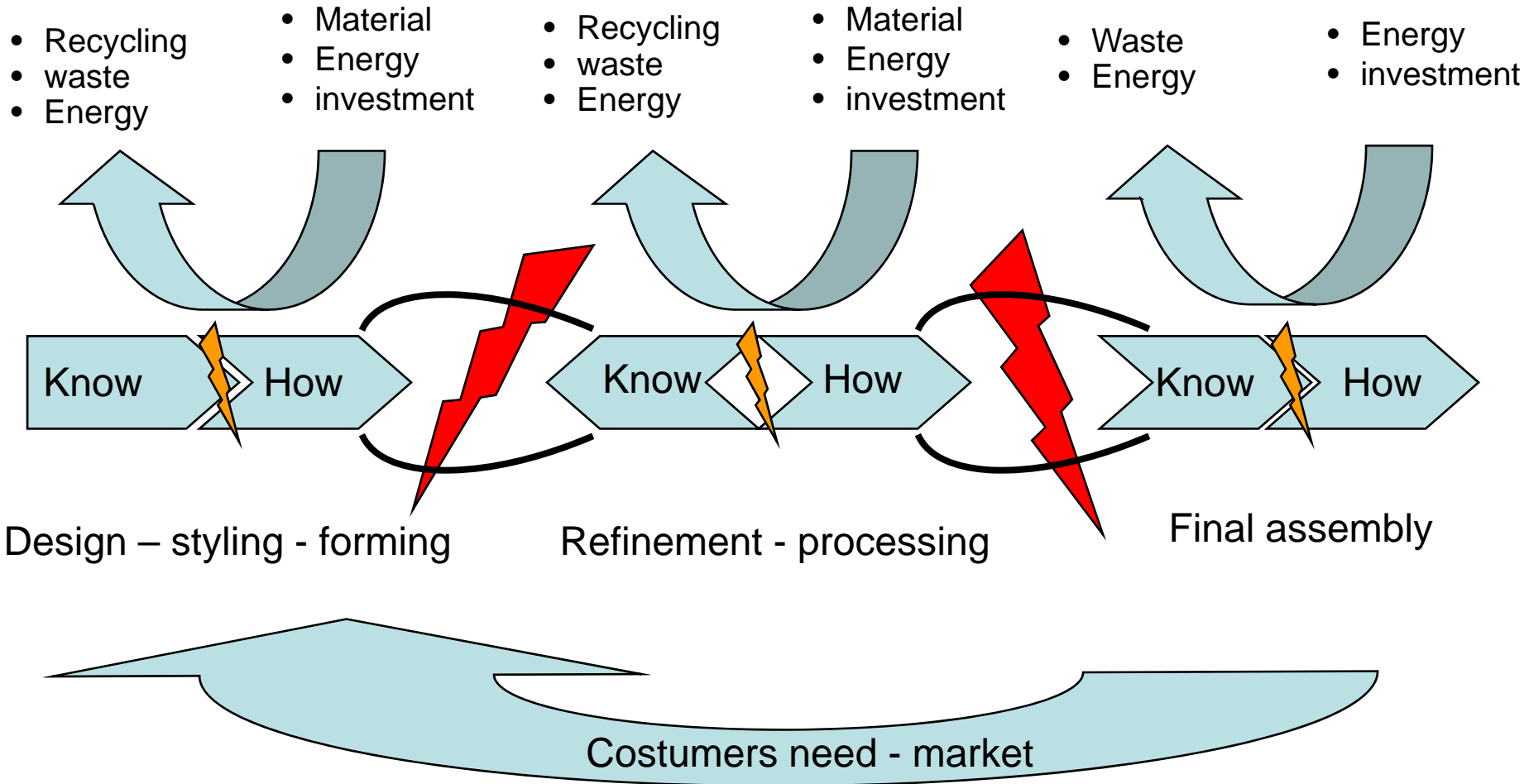
Irregularities of the substrate leads to local damages of the processed unit



Engineering

Added value and efficiency by extensive adaptation of the units to sophisticated application

Interconnections within the production chain



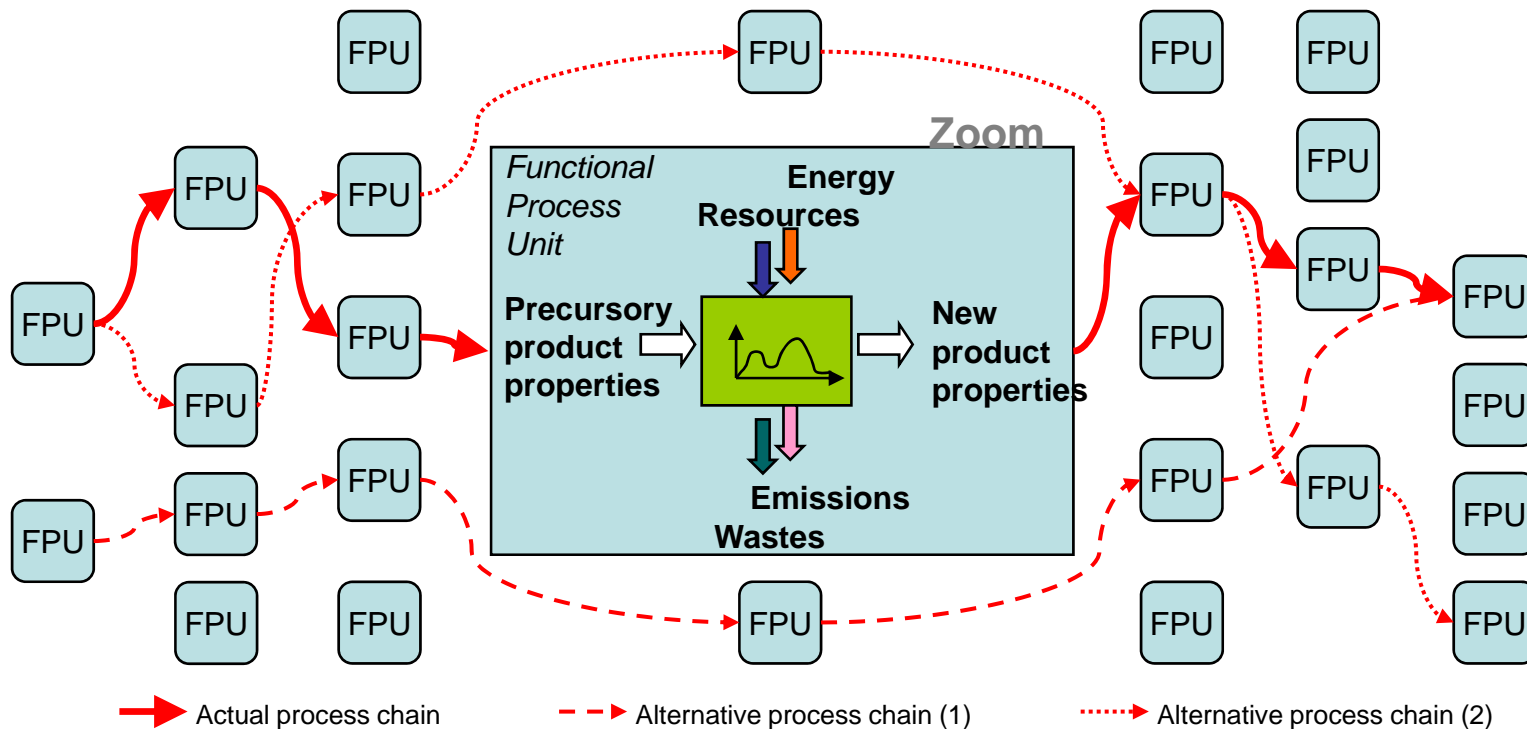
The CleanProd vision



“A construction kit for process eco-engineering

- Modularisation, based on in-depth analysed functional process units (FPU)
- well-defined process interfaces, and
- advanced indicators for CSM assessment

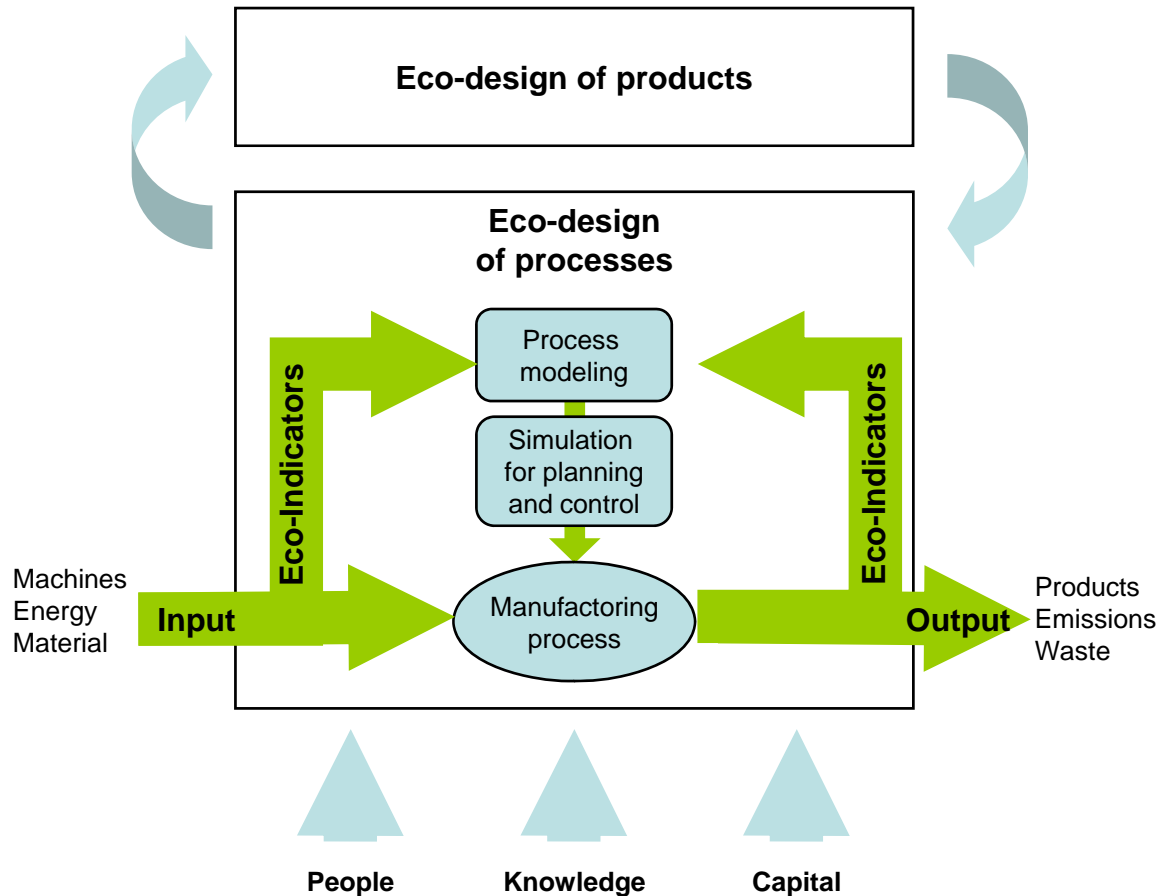
will allow to eco-design the optimal sustainable production route for any new high value added product.”



The CleanProd approach



The requirement: A dedicated holistic and integrated RTD approach



Manufacturing optimization under a life-cycle perspective is a multi-objective optimization problem.

Addressing the overall process chain in an integrated approach leads to optimal results for the overall process efficiency and sustainability.

Main RTD themes



The CleanProd Integrated Project proposal

Scientific understanding	Comparable physical / chemical understanding of processes along process chain from forming / machining to surface finishing			
	Complexity of multi-objective optimisation	Common terminology		
Technological comparisons	Process modelling & simulation	Measurement processes & parameters; sensor technologies		
	CSM indicators			
	Functional comparisons			
Interface analyses	Process interface analyses	Metal pieces	Organic coating	
	Life cycle analysis	Plastic pieces	Galvanic coating	
	Horizontal knowledge integration across engineering disciplines			
	Physical coating			
Process engineering	Data Analysis of interdependencies & control parameters	Integrated Knowledge Structure		
	Advanced process chains from forming / machining to surface finishing	Modularisation / functional process units	Various combinations of substrate & coating materials	
		Multi-objective optimisation		
		Eco-design of new processes		
		Integration with eco-design of products		
Innovation management	Business models	Reduced lead times for new technology integration	Standardisation: CEN-Workshops (terminology; indicators; process chain design)	

Main benefits



The CleanProd Integrated Project proposes four major contributions to substantially increase competitiveness and sustainability of manufacturing processes

Expected impact

- Process models enabling the continuous simulation/modelling of the process chain, with interfaces to the eco-design of products
- From eco-indicators to CSM-indicators:
 - Comparison and ranking techniques of manufacturing processes with regard to their competitiveness and sustainability performance, innovation potential and social impact
 - Establishing such CSM ranking options as decision support criteria for the optimal choice of critical manufacturing processes
- Advanced CSM-indicator based life-cycle optimisation by better integrating the eco-design of products and processes
- Reduced time-to-market of manufacturing process innovations through improved capabilities to integrate new processes into the process chain

Thank you for your attention!

